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March-April 1987

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COVER: CAPT Lance Sholdt, MSC, reviews map of fly-infested areas at tsetse central picket checkpoint not far from Lutale, Zambia. Sholdt, a Navy entomologist, recently traveled to Africa to test the effectiveness of new topical repellents and clothing impregnated with permethrin, a repellent/insecticide. Story on page 10. Photo by Carl Schreck, U.S. Department of Agriculture.

Care and Caring

There are two essential elements to our mission in the Navy Medical Department—care and caring. There is no question in my mind that we administer the finest medical and dental care in the world, and that our people are among the best in both knowledge and motivation. We have a sophisticated, extensive training system, research which has brought important breakthroughs to medicine as a whole, and we practice medicine with a range of versatility and challenge unparalleled in any other area of medical endeavor. We have a great deal to be proud of.

There is a lot of caring as well. Our people care about their patients, their welfare, and their treatment. It is in perception, however, where we sometimes fail in the small but important things which mean the most to those we serve. Our average patient is not qualified to judge the excellence of the medical care we provide, but each one is a certified expert on how good we make them feel as human beings during the course of that treatment. They cannot see the magnificent product of delicate surgery, or know how much knowledge goes into the accuracy of a complex diagnosis and treatment regimen. Sometimes they cannot even know that life and health have been preserved by the most timely and professional action. What they do know and long remember is how they were treated as human beings by a doctor, nurse, or corpsman, and whether that made them feel better or worse.

Recently I read a letter from the mother of a chief petty officer who had been treated for a very serious illness at one of our west coast hospitals. Her son did not survive and died early on the morning of Christmas Eve 1986. Hospital staff not only offered her the hospitality of their homes, but stayed with her during the holiday. Despite one of the most crushing losses a mother can suffer, this lady wrote the hospital commander in glowing terms to thank by name each member of the staff who had helped her.

During a very difficult time this lady had been the recipient of kindness and the highest quality of caring concern from all segments of the hospital staff. From physicians and nurses to civilian staff, corpsmen, and chaplain, she received the kind of treatment which is a benchmark for each of us. In her letter she said, "This was my first association with the Navy. I know they took care of their own, but they treated me like I was one of their own too."

Few of us are called upon to provide on a daily basis the type of caring this naval hospital staff offered. By comparison, it is much easier to find patience and cordiality for someone coming to one of our facilities who is out of sorts because they do not feel well, whose husband has perhaps been deployed several thousand miles away, or who has traveled a great distance only to find a long wait for treatment in a crowded facility. We owe this courtesy, patience, and understanding as an essential part of the human equation which we treat every time we see a patient. It is something we dare not forget.

Patient satisfaction is not only the correct and professional result of our efforts and the right thing to do, it also contributes to retention of good people and thereby maintains the readiness of our force. There is no excuse for not providing this caring and courtesy, and every reason for ensuring that we do. A good rule of thumb is to give every patient the kind of careful consideration you would expect to be given to a member of your own family. If each of us does this, the perception of callous, uncaring actions by medical people will quickly disappear.

Commanders must involve themselves in the development and execution of training programs which will ensure that all who are involved with patient contact have been equipped with the skills for dealing successfully with people who greatly need our help. Civilian medical organizations have put a great emphasis on this in recent years and do it very successfully. We can do no less for those who wear our own uniform, share our own profession of arms, and are members of our Navy-Marine Corps family.

RADM Joseph S. Cassells, MC

NAS Alameda's DVECC . . .

The Micro Gen HD truck-mounted machine for insecticide dispersal at ultra-low volume is checked by a Reserve training class at Point Molate.

. . . Takes the "Bugs" Out

The science of medical entomology was born in 1878, when it was shown that insects, especially mosquitoes, played a role in the transmission of disease. Medical entomology is the branch of zoology dealing with insects or other organisms that transmit disease to humans. These insects are referred to as disease vectors. Military entomology originated in 1900 from Major Walter Reed's work on the transmission of yellow fever by the mosquito *Aedes aegypti.*

In WWI malaria was not considered a serious threat in Europe. By 1940 however, much of Europe was once again at war. In the Pacific, the Japanese had built a formidable war machine and the United States was faced with the possibility of war on that front. This meant committing men and machines to combat in locations rife with malaria and other vector-borne diseases. By 1941 steps were initiated to deal with such an eventuality. The Navy Medical Department established the Hospital Volunteer Specialist Group, H-V(S), to fill the need for specialists in the fields allied to medicine. The need for entomology assistance was expressed at this time. The first Navy entomologists were commissioned in May 1941.

The story of entomology in the South Pacific campaigns began when a battalion of marines occupied the island of Efate in the New Hebrides in April 1942, for the purpose of building an airfield and to forestall the southward advance of the Japanese. Malaria was rampant on the island and a team of medical specialists was dispatched to combat this devastating loss of manpower. Arriving in August 1942, the team included the first Navy entomologist to work in a combat zone, ENS Kenneth L. Knight. Within a year the malaria case rate on Efate had dropped to essentially zero.

Malaria caused five times as many casualties in the South Pacific as did combat. Field laboratory teams were developed to fight this devastating disease.

Entomologists in WWII served not only in the South Pacific but in China, North Africa, the Caribbean, and Central America. Two entomologists lost their lives and six were decorated.

Following WWII most entomology units were disbanded with the exception of a unit at NAS Jacksonville, FL. "The H-V(S) section disappeared at this time. With the establishment of the Disease Vector Ecology and Control Center (DVECC) Alameda in 1957, the Navy had two sister units each with vector control responsibilities encompassing half the world. DVECC Jacksonville covers from the Mississippi River east to Pakistan and DVECC Alameda covers from the Mississippi west to Pakistan.

Both centers have provided service during the Korean and Vietnam conflicts. Most recently both centers received the Meritorious Unit Commendation for disaster relief operations in the Caribbean following Hurricane David, and were praised for their augmentation of the Fleet Marine Force in Lebanon.

"We can virtually be called anywhere in the world," said CDR Herb Bolton, MSC, DVECC's officer in charge. "Since Hurricane David, a military program was formed which the Navy Medical Department calls Mobile Medical Augmentation Readiness Teams (MMARTs). There are many kinds of MMARTs, such as surgical and nursing. We're one of many teams that can be called to aid in a disaster. Everyone working at DVECC Alameda is essentially on 24-hour alert."

In addition to disaster relief, DVECC also aids and shares its knowledge with local communities. It conducts training courses for the San Francisco Bay Mosquito Abatement Council and also helps the council run equipment and identify mosquitoes. "But we learn from the council too," Bolton pointed out. "They're experts in control and together we help each other to coordinate mosquito control in the bay area."

While aiding the community is an important part of DVECC's job, its military mission is to provide optimal pest management support to the Navy and Marine Corps operating forces and shore facilities in a manner which protects health, maintains morale and efficiency, prevents property loss, and preserves environmental quality. "Disease has played a significant role in warfare throughout history," Bolton said. "There are vector-borne diseases that could incapacitate a military force." All branches of the military have DVECC units prepared to meet these needs if necessary.

Some of the ways DVECC Alameda helps fulfill this mission is by keeping the peacetime Navy well informed on disease vector control. DVECC pro-

Dispersing ultra-low volume insecticide from the Micro Gen HD is demonstrated.

vides training in operational entomology, preventive medicine, pest management for civilian and military personnel, shipboard pest management, special courses, workshops, and on-the-job training. In addition, it writes and publishes pest control manuals and produces films.

With winter rains, many homes are invaded by field mice. In DVECC's *Shipboard Pest Control Manual* there are some helpful hints on how to get rid of these intruders: "Prior to placement of baited (mouse) traps, the traps should be put out baited but unset. This gives the rodent a chance to become familiar with the trap and bait (i.e., gives them a false sense of security). They should be left in this condition for 2-3 days prior to actually setting the spring and trigger." It may not be a better mouse trap, but applied mice psychology does work.

DVECC also has an extensive equipment training center at Point Molate. "All our disease vector classes are taught at NAS Alameda first; then trainees are given a hands-on equipment operating experience at Point Molate," Bolton said. "One of our tools is insecticides and we have a variety of equipment for application from hand sprayers to truck- and helicopter-mounted spray equipment."

While DVECC doesn't have research facilities for developing new ways to control vector-borne diseases, they do evaluate commercially developed products that are constantly being marketed. "Through the Armed Forces Pest Management Board we will receive a piece of equipment or new pesticide from a manufacturer and we will evaluate whether it's durable enough, whether it can be used on board ship, and basically, whether it does the jobs that the military needs done."

One fascinating new product that DVECC will soon evaluate is something recently developed by a local company that keeps the hormone level of cockroaches, flies, and fleas at the juvenile level. What this means is that insects treated with this product cannot reproduce. "We are going to try to add this product to our present vector control arsenal so that we can reduce the amount of pesticides we have to use," Bolton said.

LCDR Rob Stevenson, medical entomologist, is DVECC Alameda's resident beekeeper. In addition to his many disease vector control responsibilities he takes the time to lecture visiting scout groups and local schools on the art of beekeeping and how to remove a bee's stinger.

"I ask the students, what do you do when a bee stings you?" Stevenson said. "Some of them say they'd call their mom or call their doctor. I tell them that the first thing you do is to scream bloody murder because it hurts. The second thing you do is to scrape that stinger out using your fingernail or a blunt object. Then I explain why."

When a bee stings you it leaves its stinger in your skin. The stinger has barbs on it which causes it to stick. When the bee flies away the stinger, poison sack, and part of the bee's musculature and nervous system is left in the person's skin. The bee soon dies because it has lost a good part of its body and organs. But that musculature attached to the stinger continues to pump the poison from the sack, through the stinger and into the victim.

"The sooner you scrape that stinger away the better," Stevenson continued. "Most people grab the stinger between their fingers and pull it out. But when they do that, they pinch the poison sack and inject the poison into themselves."

Though bees are not disease vectors, they are medically important because of their venom. More people die from bee stings than from snake bites in the United States. "When a bee stings she releases a pheromone, an external hormone that carries a scent other bees are sensitive to," Stevenson said. "This pheromone alerts the other bees that this person is an intruder and did something wrong so other bees readily sting the same person. Killer bees are more sensitive to this aggressive pheromone and react quicker and with greater numbers than other bees. This is why they're so dangerous and can kill a person with multiple stings."

"Working at DVECC Alameda is a challenging job. We're always doing something different and interesting," Bolton said. □

LCDR Stevenson shows the portable observation hive he takes to local schools for instruction on beekeeping.

—Story and photos by David Kashimba, Public Affairs Office, NAS Alameda, CA 94501.

Fleet Marine Force Dentistry

Does the article's title sound unusual? Many do not realize the role that Navy dentistry plays in Marine Corps operations. For Dental Corps officers and enlisted dental technicians assigned to the 2d Dental Battalion of the 2d Force Service Support Group (2d FSSG), Marine Corps support is their main mission. Headquartered at Camp Lejeune, 2d Dental Battalion personnel serve in garrison clinics there as well as at MCAS Cherry Point, MCAS New River, MCAS Beaufort, Camp Elmore, and Camp Geiger, in support of the II Marine Amphibious Force, Fleet Marine Force, Atlantic. Similar dental units serve under the 1st and 3d FSSG in the Fleet Marine Force, Pacific.

Aside from Navy identifying insignia, members of 2d Dental Battalion look like the marines they serve. Authorized to wear the Marine Corps uniform while assigned to the Fleet Marine Force, it is routine to find patients being cared for by dental officers and technicians garbed in camouflage utilities or the service "C" uniforms. Wearing "Marine green" develops a sense of comradship and belonging among the sailors and the Marine air, ground, and support elements for whom they care.

What do dental personnel do in the field? They perform the same tasks performed in garrison, and more. The "and more" portion of the answer is derived from the dental unit mission statement found in the *Fleet Marine Force Manual* 4-5, which states:

"The mission of the Fleet Marine Force dental units is to provide dental service support for a Marine amphibious force and to provide specialized care of casualties with maxillofacial injuries. During a mass casualty situation, FMF dental units will assist the medical effort as required."

The physician and corpsman extender roles assigned to the Navy Dental Corps afield are similar to that played by dental department personnel during general quarters and mass casualty scenarios aboard ships. In fact, while embarked aboard Navy amphibious ships, FMF dental personnel share dental department facilities and augment established casualty care teams in transit to operating areas.

Physician and corpsman extender training for field and afloat operations is provided by the Field Medical Service Schools (FMSS) at Camps Lejeune and Pendleton. As follow-on to Dental Technician "A" School training, dental technicians attend the 5½-week FMSS course with hospital corpsmen. Dental officers attend a 2-week course at FMSS, as well as the triservice Combat Casualty Care Course (C-4) and regionally conducted Casualty Treatment Training Course (CTTC), to improve their medical and field survival skills.

Enroute to field exercises, dental personnel obtain and inventory Field Dental Operatory and Field Dental Clinic authorized dental allowance lists (ADALs) from the Medical Logistics Company. These ADALs are separately packaged in durable metal containers designed for field use. An ADAL 662, Field Dental Operatory, includes a dental unit, collapsible dental chair, instruments, and consumable supplies to support one dental officer and his dental technician.

The ADAL 664, Field Dental Clinic, adds a dental X-ray machine and processor, endodontic instruments and supplies, limited prosthetic capability, and additional surgical instruments to support up to six field dental operatories.

As dental personnel also support Marine Air Ground Task Forces (MAGTF) aboard amphibious ships, ADALs are obtained prior to embarkation and stored in the ship's hold for later use in the amphibious objective area. During transit, support group dentists and technicians augment the host ship's dental department and care for both ship's company and the embarked marines. Should the MAGTF commander assign dental personnel to ships not having dental departments, an additional ADAL may be taken aboard for temporary clinic establishment in sickbay or messdeck areas, with the force commander's approval.

Once supplies are offloaded to the beach, the portable operatories will be set up for use by the clinic teams. Since the marines are required to be in dental classes 1 or 2 prior to deployment, the majority of the dental treatments will be of an emergency nature.

The 2d Dental Battalion recently participated in a 4-day field exercise entitled DENFLEX 86. Held annually, DENFLEX 86 provided valuable training for 2d Dental Battalion units in NBC defense, field equipment use, security, radio procedures, sanitation, and general military training topics. Medical training included IV therapy, suturing, wound debridement, combat psychiatry, heat and cold injuries, shock, hemorrhage control, airway management, maxillofacial injuries, and principles of triage, taught by members of the 2d Medical Battalion and the FMSS. The exercise proved valuable for all participants and enhanced readiness for contingency operations, according to CAPT J. Johnson, DC, acting 2d Dental Battalion commander.

Their dedication to serving the Marine Corps in garrison, afield, and afloat, coupled with their operational medical and dental training, make the Fleet Marine Forces dental units valuable contributors to Navy medicine.□

—Story by LCDR Richard J. Titi, MSC, USN, Fleet Marine Force, Atlantic.

Ulcerative Colitis: A Review (Part I)

LT Steven E. Swartz, MC, USNR
CDR Adam M. Robinson, MC, USN

Ulcerative colitis is a disease of unknown etiology involving ulceration of the mucosa of the large bowel. It was originally described by Wilks and Moxon(*1*) in 1875. The purpose of this review is to summarize the pathophysiology, diagnosis, and treatment options, including the indications for surgery and the surgical treatments that are available.

Fifty percent of all patients initially presenting with ulcerative colitis are in the 20-39-year age group. Approximately 25 percent are between 40 and 60 years old. Fifteen percent are under age 20, and approximately 10 percent are over 60. There is a slight female predominance. There is also a marked increase in incidence in whites, American Indians, and European Jews. There is a familial predisposition to ulcerative colitis in certain families; however, 70-90 percent of those patients will have a negative family history of the disease. There are also some interesting studies by Harries et al.(*3*) that show a decreased incidence of smoking in patients with ulcerative colitis, although these are not fully substantiated.(*4,5*)

Etiology

Wilks and Moxon originally postulated ulcerative colitis was secondary to a bacterial infection. However, they were never able to isolate the bacterial agent that initiated the disease. Throughout the last 100 years, many etiologies for ulcerative colitis have been proposed,(*2,6*) although none have been substantiated. The possibility of viral and bacterial etiologies have been intensely studied, with no agents positively identified as transmitting the disease.(*5*) There have been several studies that have looked at psychological tests on patients with ulcerative colitis, and it was thought for some time that ulcerative colitis was a psychosomatic disease.(*2*) Most of the patients have been shown, however, not to have remission of their ulcerative colitis if their psychological problems were resolved. In patients undergoing total colectomy, however, several have resolved their psychological problems postoperatively.(*7*) Currently, the most popular theory for the etiology of ulcerative colitis involves an immunologic basis.(*6*) Some have postulated a reaction to certain foods, but no foods have been demonstrated as causing ulcerative colitis.

Current research revolves around autoantibody formation to colonic mucosa, although there is debate whether the autoantibodies found circulating in patients are a primary cause of the disease or secondary to the inflammation noted in the disease.(*6*) There are studies of circulating immune complexes(*6*) which also have not been demonstrated to be either primary or secondary in nature.

Pathology

The gross anatomic pathology of patients with ulcerative colitis reveals a shortened, thickened, rigid tube of colon with a shortened mesentary. There are decreased haustrations. There may be discrete ulcerations of the mucosa, no ulcerations evident, or a sea of ulcers that coalesces to form pseudopolyps (islands of normal colonic epithelium surrounded by areas of ulcerated mucosa).

Microscopic examination reveals infiltration of the mucosa and submucosa with mononuclear cells, with loss of surface epithelium and mucosa. There are also generally noted crypt abscesses which are accumulations of inflammatory cells in the crypts of Lieberkuhn. Crypt abscesses may be one of the early lesions of ulcerative colitis. Several

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of them are postulated to coalesce, actually lifting the mucosa off the bowel wall, causing large ulcerations that are characteristic of this disease in its more serious form.(*7*)

Ulcerative colitis is a disease that begins in the rectum and extends proximally along the large bowel. In this regard it has often been suggested that ulcerative proctocolitis would be a better name,(*2*) however, ulcerative colitis is entrenched in the literature. The extent of the disease, though, is very important in determining the prognosis and treatment. Those patients with disease confined to the rectum and rectosigmoid generally have a benign course and often respond better to treatment than patients with disease extending to the hepatic flexure or beyond (pancolitis.)

In a series of 465 cases seen at the General Infirmary at Leeds, England, from 1955 to 1963,(*2*) approximately 30 percent involved the rectum or rectosigmoid only. Another 30 percent involved the left side of the colon, and the final 30 percent were noted to be pancolitis. Three percent, however, had only segmental involvement of the colon, sparing the rectum. Thus, while it is possible there may be no rectal disease in patients with active ulcerative colitis, it is unlikely and should point to other diagnoses.

History

The most common symptoms of patients with ulcerative colitis are diarrhea and rectal bleeding. The diarrhea may be mild (3-5 loose stools per day), moderate (5-10 stools per day), or severe (10-20+ stools per day). The diarrhea may be used to follow the course of the disease by using a rectal stool gram—a chart with the number of stools per day. The rectal bleeding may be minimal or none, gross hemorrhage, or anywhere in the spectrum between. This is usually associated with a mucous discharge from the rectum. The bleeding can also be followed to determine the response to treatment.

In the series by Goligher, 85 percent of his adult patients had either bleeding or diarrhea.(*2*) In children the percentage was slightly less (73 percent), with other symptoms being more common. Both adults and children can also have abdominal pain on presentation. The pain is usually colicky and lower abdominal in nature. It is usually associated with a more serious exacerbation than those patients without abdominal pain. Another symptom may be anemia. The anemia may be due to chronic blood loss or iron deficiency, folate or B_{12} deficiencies, or anemia of chronic disease. Pyrexia is also common in acute attacks with temperatures between 99° F and 101° F. Temperatures above 102° F are far less common in patients with acute exacerbations of ulcerative colitis. The patient is often referred to the gastroenterologist, or colorectal surgeon with a diagnosis of hemorrhoids, dysentary, functional diarrhea, irritable bowel syndrome, or to rule out neoplasm.

Ulcerative colitis is also confused with Crohn's disease, ischemic colitis, and irradiation colitis. These patients can be difficult to diagnose, but most of them will present with a classic history of diarrhea, rectal bleeding, and mucous discharge in the stool. Several times per day they may have a stool that consists mainly of mucous and bloody discharge.

Physical Examination

Ulcerative colitis is a protein-losing enteropathy. Thus, the extent and duration of the disease is very important in determining how the patient will present. The patient's general appearance may range from no apparent distress to gross emaciation, depending on the extent of bowel involvement and the duration of disease activity. Likewise, the abdominal exam may be unremarkable or may show marked weight loss, or tenderness over the colon on palpation, especially in more acute exacerbations of the disease. On rectal exam there may be abscess, fistula, fissure, anal spasm, or stenosis. Although these external rectal symptoms are more commonly associated with Crohn's disease, up to 17 percent of patients with ulcerative colitis will have anorectal complications.(*8*) On digital exam of the rectum, there will frequently be noted bloody mucous and purulent material on the examining finger. At this point in the patient's evaluation, between the presenting history and the examination, a suspicion of ulcerative colitis as cause of the patient's problem can be made.

The proctoscopic examination is mainly confirmatory of suspicion developed on the history and physical exam. Prior to the proctoscopic examination no enema should be used. The phosphate enema that is commonly used can cause irritation and friability of the bowel wall that can be confused with inflammatory bowel disease. When the proctoscope is inserted into the anus, there will very frequently be found blood and mucopurulent material in the rectal vault. On clearing that material, the mucosa is frequently noted to be thickened and granular in appearance. The three most significant findings on proctoscopic exam are an absent vascular pattern, punctate hemorrhages or the finding of discrete ulcers, and marked friability of the mucosa.(*9,10*) The mucosa will often bleed with very minimal trauma, either from the proctoscope or a swab used to rub the mucosa.

Colonoscopy is also a useful examination in patients with ulcerative colitis. It generally is not used as a diagnostic tool acutely, but is very good to evaluate the extent of the disease, which has a bearing on prognosis. Colonoscopy can also be used to follow the extent of the disease over time and, as will be discussed later, to obtain multiple biopsies along the colon in screening for cancer prevention.

Radiologic Findings

Barium enema is generally contraindicated in acute exacerbations of ulcerative colitis as it can cause further increase in irritation of the bowel and in symptoms. Barium enema is extremely useful, however, in following

patients chronically. It can be used to delineate the extent of the disease in the colon, and to evaluate response to treatment. Findings on barium enema that are consistent with ulcerative colitis are decreased haustrations and straightened, shortened, decreased calibre of the colon, with the so called "lead pipe" appearance. There may be evidence of a shaggy mucosa that represents polyps or pseudopolyps, and there may be widening of the perirectal space (greater than 1-2 cm) that results from edema in ulcerative colitis.

Plain X-ray films of the abdomen, unlike barium enema, are extremely important in all acute exacerbations. They may reveal a decrease in haustrations from the gas pattern in the abdomen, and may reveal free air in the abdomen. They are the key to diagnosing toxic dilation of the colon. Toxic dilation of the colon is defined as any dilation greater than 14 cm in the cecum or 10 cm in the transverse colon. Because of the severity and complications of toxic dilations (or toxic megacolon) in patients with ulcerative colitis, it is necessary to have regular plain films of the abdomen on all patients admitted for acute exacerbations of disease.

Medical Therapy

One of the mainstays of therapy for ulcerative colitis is sulfasalazine (Azulfidine). This drug is an azo combination of sulfapyridine and 5-amino salicylic acid. It does not have a rapid onset of action and in acute exacerbations of disease is less useful; however, it is extremely useful as maintenance medication and has been shown to decrease the incidence of exacerbations.(*11*) The mechanism of action of sulfasalazine is quite interesting.(*12*) The 5-amino salicylic acid group has been shown to be the active moiety. When the drug is taken by mouth, the sulfasalazine passes through the stomach and small intestine where acetylsalicylic acid would normally be absorbed. On reaching the large intestine sulfasalazine undergoes bacterial degradation into its basic sulfapyridine and 5-amino salicylic acid groups, allowing the 5-amino salicylic acid to exert a direct anti-inflammatory effect on the mucosa of the large bowel. The sulfapyridine is a relatively weak antibiotic and has not been shown to itself play an active part in the therapy.

Corticosteroids are the drug of choice in acute exacerbations of ulcerative colitis. They quickly decrease the amount of inflammation of the bowel and are very useful in bringing about remissions of the disease. They are also quite useful in that they can be given in several dosage forms, including intravenously, by mouth, or by enema, allowing the steroid to act directly on the rectal mucosa. Unfortunately, these medications are difficult to use chronically because of their systemic side-effects. Hydrocortisone enemas are most useful in patients with ulcerative proctitis or disease limited to the rectum and sigmoid only.

Several immunomodulators have been tried with varying degrees of success in differing reports. Azathioprine has been shown to have some efficacy in treating patients with ulcerative colitis, especially in reducing the steroid requirements to bring about a remission and to maintain patients chronically.(*15,16*) Metronidazole (Flagyl) has also been used. While it is controversial in its ability to bring about a remission of the acute symptoms, it has been found to be useful in the treatment of anorectal complications of ulcerative colitis.

Patients with ulcerative colitis when admitted to the hospital are very often kept at bedrest, and/or bowel rest. They are maintained with elemental diets or total parenteral nutrition. It is difficult to assess in clinical trials the benefit of bowel rest because of the nature of ulcerative colitis (exacerbations and remissions despite or in spite of therapy given). Total parenteral nutrition may be useful in those patients whose protein-losing enteropathy has made them less able to tolerate their exacerbation of disease. It will also make the patient a better surgical candidate should they develop an indication for surgery.

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Don't Shoot at the Orange Cross!

COL James H. Jeffries III, USMCR

On 22 Aug 1864 the ministers plenipotentiary of 12 nations met in Geneva and solemnly signed the first Geneva Convention for the Amelioration of the Condition of the Wounded in Armies in the Field, thus initiating the first in a long series of important law of war treaties for the humanitarian protection of combatants rendered *hors de combat*. In a gesture of respect for the Swiss sponsors of that convention, an international symbol for the protection of military medical personnel, installations, and equipment was adopted consisting of the reversed colors of the Swiss national standard: a red cross on a white background.

In 120 years of war and peace, three successive evolutions of the Geneva Conventions (along with several additional protocols and supplements) have retained and magnified the significance of the red cross (and its Moslem counterpart, the red crescent). Today, 165 of the 171 nations are pledged to respect and honor the protection it affords to military medical personnel and their patients. It is in evidence in every trouble spot in a troubled world and is probably the most universally recognized humanitarian protective emblem in history—except in the United States Navy.

Two years ago, while my Marine Corps law of war training detachment was conducting one of our 1-week formal courses at Coronado Naval Amphibious Base, we noticed that the Navy ambulances parked at the clinic next door were inexplicably adorned with bright orange crosses. Curious, I inquired of an unsuspecting commanding officer as to the reason for this phenomenon. At a loss for an explanation, the commanding officer resorted to that time-honored naval protective reaction and called for his chief petty officer. When the chief also pleaded ignorance, I knew we had a real mystery on our hands. I marked the matter off as an aberration, theorizing that we had been at peace so long that all the civilian ambulances with their green and pink variations of crosses (civilians may not legally use the red cross—18 U.S.C. sec. 706) had somehow caused a curious notion in some naval person's mind that military ambulances were supposed to look like their civilian counterparts.

Then, last summer on Okinawa, we saw more orange crosses on Navy ambulances and realized we were not dealing with a mere coincidence. Investigation determined that the culprit is the Naval Facilities Engineering Command which has issued something labeled NAVFAC P-300, paragraph 25-13 of which dictates that the identification markings on (Navy) ambulances shall be "Orange (Color E)" otherwise identified as "Omaha Orange, DuPont Paint No. 31L or equal."

Now, fellows, I'm sure the folks in Omaha are honored, but I'm equally certain the folks in Geneva aren't. Neither are we combatants who may have to be transported in these vehicles. An "orange cross" has exactly zero international law of war protection, disregards a century of solemn treaty commitments, and raises some other interesting legal questions. I was relieved to see that the new hospital ships *Mercy* and *Comfort* abuilding across the bay still had their red crosses, but I have no doubt that some genius somewhere in the system is plotting some mischief with Grand Rapids Green or Peoria Pink. Come on guys. Get with the program. If the engineer types will promise to quit practicing law, we law of war types will promise not to build any facilities.

The author is the commanding officer of the Marine Corps law of war training detachment assigned to the Training Department, Headquarters Marine Corps. At least 200 naval officers, including some medical officers, are graduates of the course and qualified to advise the Naval Facilities Engineering Command on the lawful color of protective emblems.

Beating the Sting:

Operational Entomologists Protect the Troops

Diane LaMacchia

Photo by CAPT Lance Sholdt, MSC

The UNDP/FAO (United Nations Development Program/Food and Agriculture Organization) at Lutale is an ideal field site for research and testing. It is adjacent to a lake infested with schistosomiasis (trematode parasites or blood flukes) and where malaria is also endemic. Only a few kilometers away are tsetse flies and trypanosomiasis.

"When they go in and hit a nerve, it hurts so bad that you slap yourself, and the slap hurts and it makes you angry.

"If they miss a nerve and get a full blood meal, you can honestly hold them up and shake them and watch the blood swish in the abdomen."

—CAPT Lance Sholdt, MSC, on tsetse flies

Zambia

In November 1986, Navy entomologist CAPT Lance Sholdt and Carl Schreck, an entomologist from the U.S. Department of Agriculture in Gainesville, FL, flew to Lusaka, the capital of Zambia in central Africa. There they met four African entomologists from the Tropical Disease Research Center in Ndola. The six scientists and their driver rode west in a Land Rover to a remote field site run by the Food and Agriculture Organization of the United Nations.

Their purpose was to test a new topical repellent and a clothing impregnant designed both to repel and kill what Sholdt calls those "terrible, terrible biters"—tsetse flies. The study was conducted under a research and development program sponsored by the U.S. Army.

Tsetse flies transmit a sometimes fatal disease called trypanosomiasis, more commonly known as sleeping sickness. According to Navy epidemi-

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Photos by Carl Schreck, USDA

CAPT Sholdt demonstrates to curious Zambian teenagers how a mosquito light trap functions. Traps like this are used to monitor malaria vectors and other mosquito populations.

ologist, CAPT Richard R. Hooper, MC, the tsetse fly is very hard to eradicate because of its wide-ranging habitat.

Sleeping sickness is caused by a parasite. The worst kind of parasite is carried by many wild and domestic animals including cattle, Hooper said. The flies bite cattle, then bite a human and transmit the parasites into the human's bloodstream. The parasites multiply in the bloodstream and attack and kill cells in the central nervous system. At first the person may just become feverish and the illness may not be identified. But later, the victim becomes characteristically semicomatose and even dies, leaving no doubt as to the origin of the illness.

Every day for 9 days Sholdt and his colleagues navigated their four-wheel-drive vehicle slowly through the underbrush. Tsetse flies are attracted to large objects and came "boiling inside," where the six scientists sat, dressed in permethrin-impregnated coveralls. Permethrin not only repels tsetse flies, but kills them as well.* Sometimes the volunteers' bare arms and faces were smeared with two formulations, a skin cream and a liquid containing an insect repellent (active ingredient: diethyltolumide or deet); sometimes their skin was left bare.

The entomologists judged the success of the repellents by counting the number of flies that lit on their exposed skin and bit them, or bit through their clothing. They concluded that these particular repellents were successful in deterring attacks by the tsetse flies. The next step in the Army's program will be to test the success of permethrin-treated camouflage material, bedrolls, ground cloths, and the netting over guns. Following these tests and before the repellents are available for use, they will be subject to approval by the Environmental Protection Agency.

*Permethrin is a synthetic pyrethroid which has very low mammalian toxicity and is considered safe for human use.

Entomologists

The Navy's 36 entomologists are part of the Navy's preventive medicine community. They focus on vectors, those insects and other arthropods (those with hardened exoskeletons) that transmit disease or—like wasps and bees—envenomize their victims. Most of the diseases caused by these biters and stingers have long been forgotten in the United States. But, according to Sholdt, vector-borne diseases are very common in the Third World. In fact, he estimates that while there might be at most 2,000-3,000 cases in the United States a year, that many might appear in a *month* in an African village.

"That's where the military aspect comes in," said Sholdt. "If we put deployed forces ashore in much of the Third World, we're going to encounter what appear to be exotic diseases that are really very common. The big ones we're really concerned about are malaria, leishmaniasis (a disease transmitted by sandflies), and dengue and other arboviruses" (viruses transmitted by arthropods).

Malaria, according to CAPT Hooper, "probably caused more morbidity in our ground personnel in Vietnam than any other disease." The mosquito injects the parasite into the human body; the parasite reaches the liver and bursts out of the liver into the bloodstream. It then bursts the blood cells and causes spiking fever. The blood sludges (thickens). This can cause stroke-like effects and death.

Dengue is a viral disease also known as "break-bone fever" for the terrible aching feeling acccompanying its other flu-like symptoms. Dengue is incapacitating and has a long convalescent period of 2 or 3 weeks. It may not always be life-threatening but has the potential to disrupt seriously an entire command. Two or 3 years ago there was a dengue outbreak in the Philippines which hit some U.S. military personnel at Subic Bay and Clark AFB, Sholdt pointed out. Dengue can result in hemorrhagic fever, an illness which is usually fatal in young children; 158 Cuban children died of hemorrhagic fever about 6 years ago in a dengue outbreak of nearly 350,000 cases.

"Much of the world lives with these things every day. When our troops are deployed to tropical areas, they are subject to the same diseases," Sholdt said.

Prevention

The best way to protect the troops from these diseases would be to inoculate them, according to Sholdt.

"If you've got a vaccine that works, is 100 percent effective, and has a long duration, that's the best you can have," he said. But so far, no vaccines have been made available for diseases such as dengue, leishmaniasis, or malaria. (The Navy, the Army, and the National Institutes of Health are working on one for malaria.)

If there are no vaccines, a second possibility for preventing these diseases is drugs. There are some better ones on the market now then those used in World War II, Sholdt said, but there are two major problems. One is that the infectious agent becomes resistant to the drugs. The second is that people don't take them.

"You're trying to get them to put on repellent, or take a drug, or do other things, and they're frankly trying to keep from getting their butts shot off," he said. "Therefore we've got to develop personal protective measures which are realistic for that environment."

In the meantime, the Armed Forces are still taking basic, preventive measures, using repellents, protective netting, and pesticides to inhibit the spread of disease.

"If you can't stop it with a drug or a vaccine, you want to interrupt the man-vector contact and stop that mosquito from getting to the individual soldier or marine," said Sholdt.

You do that by killing the insect outright or by protecting the individual with a repellent.

The first method of interrupting the man-vector contact is to concentrate on killing the disease carrier. This is what was done with mosquitoes in the

Testing topical repellents and permethrin-treated clothing: A slowly moving vehicle attracts tsetses which enter and attempt to bite. Any bites through clothing and to uncovered skin are recorded and later analyzed.

southeastern United States during and after World War II when malaria was fairly common in that region. Later, in the 1950s, the World Health Organization led an effort to develop mosquito eradication programs; they were successful in most of the developed parts of the world. DDT was sprayed inside houses, and when mosquitoes came inside to bite the inhabitants, either before or after biting, they landed on the walls to rest. There they came in contact with DDT which killed them.

The idea was to bring the mosquito population in a particular area down to near zero and stop the transmission of the disease from person to person via the mosquito. If the mosquito population is kept down long enough the number of infected humans (the human reservoir of the disease) declines. The potential for transmission of the infection is reduced and the malaria parasite is eventually eliminated.

Repellents are a different story since their efficacy relies on the individual user. In Vietnam, said Sholdt (who served with the 1st Marine Division in Da Nang, Phu Bai, and An Hoa), soldiers would not use the standard military repellent but did use brightly colored commercial cans of spray. The cans looked pretty, the spray smelled good, but unfortunately the spray contained smaller percentages of repellent than the military brand.

Because the Army wanted a repellent to last for 12 hours and afford 95 percent protection, Army scientists developed a program to study commercial repellents which use state-of-the-art technology employing microencapsulation—or timed release—and film polymers. The objective was to increase the duration, reduce the odor, and make the repellent more resistant to absorption, perspiration, wash-off, and abrasion. Sholdt tested two of these products in Zambia.

Preventive Medicine at USUHS

Sholdt is associate professor of preventive medicine at the Uniformed Services University of the Health Sciences (USUHS) in Bethesda, MD. For 2 years he has enjoyed teaching in

an unusually large preventive medicine department, the largest of any in the nation's 127 medical schools.

Sholdt is concerned with the need for practical research and tries to teach his students to recognize and solve problems in a realistic way. Having been in Vietnam and other Third World countries, he has "a perspective I enjoy passing on to the students, to give them the operational realities of what they'll face."

Sholdt has a good supply of practical experience and anecdotes to guide his students in a realistic direction. Beside his tour with the Marines in Vietnam, and forays into the field in Zambia, Peru, and Pakistan to test protective devices, he was the head of the entomology department at the Naval Medical Research Unit No. 5 in Addis Ababa, Ethiopia, for 4 years. In Ethiopia, he studied human lice and the diseases they transmit: louse-borne typhus and relapsing fever. About 60 percent of the population his group studied had body lice; they counted more than 21,500 lice in the clothing of one 80-year-old man.

These are the places where a preventive medicine person can really improve the public health, Sholdt pointed out: "Conditions are so bad that any positive thing you can do makes a big difference."

Entomologists also hope to make a big difference in the Navy setting. "Clinical medicine is there to fix the things that are broken; we're trying to prevent disease and injury from occurring," said Sholdt.

"What a lot of us are concerned about is that vector-borne diseases are preventable. When a soldier or marine dies from one, military medicine has failed."

A tsetse control official uses a sweep net to check for hitchhiking tsetse flies on land cruiser. Vehicles departing fly-infested areas must be checked before entering tsetse-free zones.

There is good historical reason for concern among the military. In all wars, disease and nonbattle injuries (DNBIs) have caused the majority of U.S. casualties. DNBIs include arthropod-borne diseases, diarrhea, psychiatric problems, and automobile accidents.

The clinical side of medicine focuses on taking care of those getting hurt in battle, said Sholdt. What is frequently forgotten is that a large part of the casualties will come from other causes. He hopes to instill in the new military physicians coming out of USUHS the ability to advise and convince their commanders in the field how crucial preventive medicine can be.

The average doctor is "abysmally ignorant" about tropical diseases, Sholdt stated. At the 126 other medical schools, he estimates students receive an average of 16 hours instruction on tropical disease and parasitology. At USUHS students receive over 200 hours of preventive medicine, including 40 hours on diagnostic and tropical medicine.

"If the physician is ignorant of the disease threat, he can't adequately advise his unit commander and tell him what countermeasures to take to protect his troops," Sholdt pointed out.

CAPT Sholdt hopes to convey the excitement of field work and the importance of practical observation to his medical students in their classwork. For Sholdt himself, it was an eye-opening experience to see things he had studied in books at home really happening in overseas settings.

Not long after he arrived in Ethiopia 14 years ago, a game warden at a wildlife preserve where he was conducting field research came over to ask him for help. Inside a stifling tent he found a man lying in a bunk, sick with chills and fever from malaria, confirmed by a blood smear. Sholdt observed a blood-fed anopholes mosquito resting on the inner wall of the tent. Outside was a pool of water filled with mosquito larvae. There, before his eyes, was the complete cycle of the disease—right out of the textbook. □

Flight deck "casualties" await triage.

Management of Mass Casualties in the Aircraft Carrier Environment

LT C.S. Wilson, MC, USNR

During World War II aircraft carriers routinely sustained mass casualties in combat. Primitive "sickbay" styled medical departments lacked resources compared with those available today as they struggled to manage such situations. Forty-one years have elapsed since World War II with American aircraft carriers standing unchallenged as combatants; yet mass casualties continue to occur frequently.

Standard shipboard hazards including fuel oil leaks with resulting fires, steam leaks, and collisions account for some carrier mass casualties. The size of the carrier and its labyrinthine complexity below decks makes the management of such scenarios very difficult.

The most threatening environment on an aircraft carrier, however, is the flight deck. The vast nature of flight operations conducted within a severely limited area, combined with the omnipresence of ordnance and jet fuel, renders the flight deck predisposed toward mass casualties. Fires, explosions, the lacerating recoil of broken arresting wires, and, of course, aircraft crashes are all realistic possibilities topside.

The complexity of the aircraft carrier below decks coupled with the high probability of flight deck disasters establishes the need for a mass casu-

Dr. Wilson wrote this article while deployed aboard USS *Midway*. He now practices medicine in Ithaca, NY.

Fire party prepares for action during GQ and mass casualty drill.

alty protocol tailored especially for each carrier. Although the protocol which follows contains some nuances unique to USS *Midway*, it is consistent with a broad plan utilized by all aircraft carriers. Mass casualties will be defined here as more than two simultaneously injured personnel.

Being a combatant, an aircraft carrier must provide for its own self-preservation. Damage control is the descriptive term designating the ship's self-repair system. Damage control consists of a network of repair lockers (stations supplied, manned, and directed toward ship's damage repair) and medical battle dressing stations, all communicating via sound-powered phones with a central point called Damage Control Central (DCC). All these positions are manned during general quarters (GQ), a condition of readiness assumed by the crew during disasters or combat conditions.

These scattered stations relay information concerning damage, fires, casualties, etc. to DCC where, under the auspices of the damage control assistant (DCA), plans are formulated, information dispersed, and ship's rescue efforts coordinated.

Likewise, as a combatant, an aircraft carrier's medical department is designed to manage large scale medical disasters. Battle dressing stations are mini-emergency departments, and are dispersed throughout the ship. Each is manned by several medical corpsmen and one medical officer or dental officer during GQ. This dispersal of resources anticipates the possible destruction of the ship's main medical department, or the inability of injured personnel to reach Main Medical due to the mandatory securing of watertight hatches (condition zebra) or the presence of fire or flooding.

During GQ a chief petty officer from the medical department is present in DCC. He channels information concerning the location and severity of casualties toward appropriate battle dressing stations and Main Medical. The senior medical officer, standing ready in Main Medical, uses information thus gained to make decisions and then direct and coordinate the efforts of the ship's scattered medical resources.

In this way the medical department interfaces with the ship's damage control system to manage shipboard disasters. Such a prefabricated organization is critical in coordinating and organizing the treatment of many wounded on an aircraft carrier.

This overview of mass casualties acknowledges that mass casualty management on an aircraft carrier is strictly a secondary priority when disaster strikes. The first priority, by necessity, is ship damage control, specifically, extinguishing fires and controlling flooding. Once control is regained and the ship secure, the mass casualty plan is effected.

The Triage Process

A cross between logistics and medicine, mass casualty management is an exercise in organization. The object is

Crewmen move patients from the conflagration site to the designated triage elevator.

to transform a chaotic situation into an orderly one where individual patients can receive appropriate medical care. Paramount is the establishment of priorities, determining which patients need intensive support and which should be moved first. This theme, common to all mass casualty responses, is triage. On the ship, this triage process will occur several times as casualties are transported from the disaster site toward the best medical resource, usually Main Medical.

As the patients are treated, triaged, and shuffled between health care providers, it is necessary to continually document information concerning patient identity, injuries identified, treatments rendered, and the triage category determined.

The triage category is documented using colored tags physically attached to the patient. Those casualties who are deceased or so seriously injured that survival chances are remote are identified with gray tags. Typically, gray-tagged patients have sustained massive open injuries of the head, chest, or abdomen, and they require a premium in medical care while offering little chance of survival. An exception to this rule are the unconscious casualties who are usually designated with gray tags irrespective of the injuries. The gray-tagged patients are treated for pain and moved aside, intensive treatments being deferred.

Those casualties who are critically injured and unstable, but salvageable, are identified with red tags. Red-tagged patients are the first to be transported toward the best medical source available, usually Main Medical. Typically, those individuals are experiencing great blood loss with incipient shock.

Patients with serious injuries who are stable are identified with yellow tags and are transported after "red tags." Burn victims are often designated with yellow tags.

The walking wounded are identified with green tags. They are treated on the spot or referred to the alternative battle dressing stations where lacerations are dressed and minor fractures splinted, etc. These patients should be treated as expeditiously as possible and, when appropriate, returned to damage control activities as their skills and labors may be critically needed.

All members of the medical staff take part in the stabilization and triage process. Physicians oversee the medical ministrations and triage decisions provided by corpsmen and dentists. Throughout this process, a major goal is to transform "red tags" into "yellow tags" and "yellow tags" into "green tags." For example, a patient actively exsanguinating from a major extremity laceration may be transformed from a "red tag" to a "yellow tag" simply by applying a tourniquet and initiating IV volume replacement.

At all times the condition of individual patients should be of premium concern as they may deteriorate rapidly with "yellow tags" becoming "red tags" etc. Therefore, consistent, even patient monitoring is stressed.

In addition to colored triage cards, a second set of cards known as treatment cards are attached to each patient during initial triage. These treatment cards have designated spaces where triage personnel write identifying information and treatments initiated. When obtainable, allergy and blood type information should be denoted on these cards as few enlisted personnel today wear "dog tags." Administration of morphine is additionally noted by marking a large "M" on the patient's forehead with a wax pencil.

Mass Casualties Below Decks

The challenges encountered and solutions applied during a mass casualty disaster differ depending on where the casualties occur, specifically below decks versus the flight deck.

Medical response and mass casualty evacuation below decks is complicated by the maze-like complexity of passageways equipped with narrow hatches and tight corners. Simple recognition of a mass casualty situation below decks may be a problem. Containing many isolated cells of activity, the carrier's obscure locations may conceal unrecognized mass casualties as damage control efforts are directed toward battling a fire or dealing with mass casualties in another part of the ship. Subsequent transmittal of information concerning mass casualties may be difficult depending on the ship's general condition.

As soon as possible, all mass casualty information should be relayed through DCC and the DCA. Upon notification, damage control personnel announce "mass casualties" and their location over the ship's public address system (the 1-MC). Medical personnel respond by reporting to their GQ stations, or moving toward the scene of the casualties if they are part of the ships ambulance service or Emergency Medical Response Team (EMRT). The senior medical officer, in conjunction with the DCA, designates a holding area near Main Medical, or the best medical resource available if Main Medical is destroyed.

This area, usually a mess deck, should be open and unencumbered as it will contain casualties awaiting surgery or other intensive care. The senior medical officer and DCA also designate a triage area near the site of the casualties. The positions of both the triage and holding areas are announced throughout the ship via the 1 MC.

The immediate burden of a mass casualty situation below decks falls upon the EMRT as they should be the first responders. However, in practice, conditions on a damaged ship may preclude timely response by the ship's EMRT, and the initial responsibility may fall upon local repair locker personnel or battle dressing station personnel.

Once the EMRT arrives at the scene, its members move as close as is safe to the site of the emergency and begin stabilizing and triaging casualties. When feasible, EMRT and local battle dressing station personnel start transporting patients to the announced triage site where they are retriaged by a designated triage team consisting of surgical personnel. At this stage the patients are identified with triage and treatment cards.

The next step is to transport patients to the holding area which is manned by personnel from Main Medical. There, while awaiting surgery or accommodations in Main Medical's hospital ward, the patients are triaged for a third time, and then continuously reevaluated, always being provided with appropriate supportive care.

Throughout this process, medical personnel should avoid exposure to grave danger, if possible, as their skills are acutely needed in a mass casualty scenario. Repair locker personnel, not medical personnel, should be utilized to extract casualties from dangerous areas, and safe surroundings should be designated as patient receiving areas. Also, movement through a damaged ship by medical personnel should first be cleared via DCC to assure a safe routing, especially when fire exists below decks.

Mass Casualties on the Flight Deck

As suggested earlier the procedure for managing flight deck mass casualties differs in several logistical respects from managing those below decks. Mass casualties on the flight deck may be announced by either DCC or the bridge. A specially designated flight deck triage team headed by flight surgeons fulfills a function similar to that of the EMRT below decks. The flight deck triage team is drawn from flight deck vicinity battle dressing stations as are the supplies to be utilized at the flight deck triage site.

At this point, some aircraft carrier anatomy is necessary. Aircraft carriers contain a cavernous space below the flight deck called the hangar bay, which functions as a combination airplane repair and storage area. Side-mounted aircraft elevators, standard on U.S. aircraft carriers, are intended to transport aircraft between flight deck and hangar bay levels. The larger carriers have four elevators, the smaller carriers (such as *Midway*) have three. They occupy varying positions along the length of the ship.

In the event of flight deck mass casualties, the flight operations manager (Air Boss) designates one of the elevators as a triage area. The elevator chosen should be as distant as possible from any flight deck conflagration site, and because casualties will eventually be lowered on it, DCC should be consulted before lowering to ensure that no fire exists in the hangar bay directly below.

The designated elevator serves as the central point of casualty management on the flight deck. There, the flight deck triage team stations itself and receives casualties. Flight deck personnel move patients from the conflagration site to the triage area using Stokes litters, Army stretchers, or simple fireman's carry if necessary.

Upon being brought to the vicinity of the elevator, patients are stabilized with airways, pressure dressings, Ringer's lactate, IVs, morphine for pain, and other immediate treatments. Following their stabilization, the patients are sorted and tagged both with colored triage and treatment cards.

The gray-tagged patients (dead or wounded) are not placed on the elevators but are placed to the side and treated for pain. The green-tagged patients (or walking wounded) are lead by deck personnel to the battle dressing stations located closest to the flight deck. Only the yellow- and red-tagged individuals are placed on the elevators, always wearing flotation coats. The "red-tagged" are placed in a distinct row inboard, as they are intended to be the first patients moved off the elevator. The "yellow-tagged" are placed in an outboard row. When the red and yellow tags are all placed, or the elevator is filled to capacity, a flight surgeon and corpsman accompany the patients and the elevator is lowered down to hangar bay level.

At this point, the sequence of events is very similar to the mass casualty scenario occurring below decks. The surgical triage team meets the arriving

Triage

Loading "red-tagged" and "yellow-tagged" patients onto the elevator after triage.

casualties in the hangar bay and re-triages them. Subsequently, casualties are moved in appropriate order via interior bomb elevators to the designated holding area located at a lower mess deck level. While in holding, awaiting their absorption into the medical department, the patients will be re-triaged and closely monitored.

"Man Overboard" Drill

An important consideration following a flight deck conflagration is the possibility that personnel have been lost overboard unnoticed. Determining the loss of a single individual or a small number of personnel on an aircraft carrier containing thousands of men is a substantial task requiring a complete muster. This muster is carried out via the "man overboard" drill.

When "man overboard" is announced over the ship's 1 MC, all crewmembers are responsible to muster with their departments. The departments subsequently report any missing men to DCC. After a flight deck conflagration, any missing individuals should be presumed overboard.

Because there are few environments short of war as dangerous as that on a deployed aircraft carrier, it follows that the quality of a carrier's medical department is not merely predicated upon the management of common afflictions, or even serious illness, or individual traumas.

The most critical responsibility tasking carrier medicine is the management of inevitable disasters utilizing what limited resources are available. Formulation and realistic practice of a mass casualty protocol is the surest way to prepare for such an eventuality. □

Guide to Hospital Smoking Policy

LCDR T.J. Halloran, MC, USN

All hospitals already have smoking policies. They may merely reflect fire codes, or they may fall anywhere along a spectrum through a total smoking ban. More and more medical facilities are taking the lead in strict regulation of smoking, and questions often arise about rewriting policy. This article answers some of those questions, suggests an approach to getting things started, and supplies a sample policy statement.

Why establish a smoking policy?

Patients, the public, and medical staff look to the hospital to set health standards for the community. The "Background" section of the sample policy covers specific health and fire safety concerns.

What should be considered?

The policy should be comprehensive. Smoking covers several categories. Smoking by visitors and outpatients, by inpatients, and by staff, and the sale of cigarettes and smoking materials should be addressed.

Visitors and outpatients are typically present at the hospital for a short time and should be able to forego smoking during their visit. Many inpatients are hospitalized for smoking-related illness and should not be allowed to smoke. Most inpatients have illnesses or injuries which are worsened by smoking, and the risks of anesthesia are heightened by their habit.

The hospital staff reflects the attitude of the hospital in their smoking habits at work. If they smoke in view of patients or visitors, or if the smell of smoke is on their hair, breath, and clothing, then it is clear that smoking is condoned.

Sale of cigarettes and smoking materials at the hospital gift shop sends an ambiguous message at best. Why battle emphysema for several days as an inpatient, then be able to pick up a couple of cartons on the way home?

Who should work on the policy?

The impetus for tightening the smoking policy may come from anywhere in the hospital community—a medical staff member, an employee or patient bothered by smoke, the cleaning staff, or the administration. Support from the medical staff and the administration is crucial to success. Administrators can usually see that a strict smoking policy enhances the reputation of the hospital, makes it easier to clean and maintain, and makes it a nicer place to live and work. The medical staff is already well aware of the ravages of smoking and likely will be very supportive of a restrictive policy.

A smoking committee may be useful in focusing policy changes. The membership should represent all aspects of the hospital staff, with some patient representation (perhaps an ombudsman or social worker).

How is the policy written?

A survey of the staff is a good way to find out where you stand. This gives an idea of what could be implemented right away with the full support of the staff and what topics will be more controversial. You may find, for instance, that almost everyone is in favor of smoke-free dayrooms for patients. Our hospital was able to cease the sale of cigarettes immediately. This kind of rapid feedback from the survey lets staff and patients know that changes are to be expected. The major drawback of a survey is that it is a great delaying tactic if a strict timetable is not established at the outset.

The question of "rights" will probably arise. You should feel confident that there is no constitutionally or legislatively established "right" to smoke cigarettes in public or at work. On the other hand, there is ample regulatory and common law precedent supporting the right of the individual to a safe place to work and of the obligation of the employer to provide it. Unions have little interest in the issue. They cannot opt for a smoke-filled environment, especially when their other efforts are for the health of their members. It is legal, and even logical, to discriminate against smokers in hiring.

Enforcement of the policy is a key issue which must be built into the policy statement. Note in the sample that specific enforcement duties and procedures are assigned. The entire staff should feel that enforcement of the policy is their responsibility, but the appropriate chain of command must be available to solve disputes. Implicit in this concept, of course, is strong support from the top of the command chain.

When should the policy be enacted?

Something should happen right away. It is reasonable to phase in the policy over a few months, perhaps beginning by offering smoking cessation classes and stopping cigarette sales. If the current policy is already quite restrictive, a total ban on smoking is the next appropriate step.

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Sample Smoking Policy for a Naval Hospital

Ref: **SECNAVINST 5100.13**
NAVMEDCOM 6200.4
National Fire Protection Association, Pamphlet 101
Accreditation Manual for Hospitals

1. **Purpose.** *To establish smoking policy for (Name of Hospital)*

2. **Scope.** *This instruction does not supersede more restrictive regulations which may be in force because of fire or other health or safety considerations.*

3. **Background.** *Smoking is the largest preventable cause of premature death and disease in the United States. Smoking is known to be harmful to the smoker and to the person exposed to "secondhand" smoke. Cigarettes are the cause of many hospital fires and are responsible for most fire deaths in hospitals. Smoking employees tend to miss more work because of illness and premature medical retirement. The hospital, as an employer, has an obligation to provide a safe working atmosphere for its staff as well as a healing environment for its patients. This obligation includes provision of smoke-free air to breathe.*

4. **Policy.** *It is the policy of the Surgeon General of the Navy that the Navy Medical Department should establish programs, procedures, and policies which serve to discourage smoking and to promote good health. The following actions are regarded as a step toward the ultimate goal of a smoke-free hospital.*

5. **Action.**

A. ***Outpatients and Visitors***

(1) Visitors and outpatients are prohibited from smoking at any time. Signs indicating this policy are to be prominently displayed at each entrance. Patient information and orientation materials should describe this policy.

(2) All areas of the hospital which are accessible to the public are designated as nonsmoking. This includes, but is not limited to, elevators, hallways, auditoriums, meeting rooms, classrooms, lavatories, waiting rooms. These areas are to be clearly marked as no-smoking areas.

B. ***Inpatients***

(1) Hospitalized patients are actively discouraged from smoking. They may do so with the express, written order of the attending physician.

(2) Smoking is not permitted in patient rooms. A case by case exception may be made for certain patients at prolonged bedrest. Proper supervision is required. This exception can be made only at the written order of the attending physician. Due consideration must be given to the needs of other patients in the room.

(3) Smoke-free dayrooms must be available for patients. An area may also be designated for smoking by patients. Appropriate supervision and safety precautions are required.

(4) All other spaces of the inpatient care area, including nursing stations, waiting rooms, common areas, hallways, examination and procedure rooms, meeting and conference rooms, and lavatories are specifically designated as nonsmoking areas.

(5) Patients are to be informed of the smoking policy through written and oral instructions during the check-in procedures. Patient information and orientation materials should describe the smoking policy.

(6) The presence of designated smoking areas does not indicate approval of smoking by the hospital or by the staff.

C. ***Staff Smoking Policy***

(1) Smoking is not permitted in the presence of patients or visitors at any time.

(2) Smoking may be permitted in offices and areas not involved in patient or visitor contact. Smoking paraphernalia may not be in evidence when visitors or patients are present. Any nonsmoker may object to the supervisor about exposure to smoke in the workplace. A reasonable attempt must be made to segregate smokers and nonsmokers within the confines of the workspace. If accommodation cannot be made to guarantee smoke-free air to the satisfaction of any affected nonsmoker, then the entire area must be designated as nonsmoking. Lounges may be designated for smoking, but equivalent nonsmoking lounges must be provided.

(3) Smoking policy in private offices is at the discretion of the occupant, within the guidelines of this instruction.

(4) Not less than 70 percent of the seating in the hospital dining room should be designated nonsmoking. Efforts must be made to keep the smoking and nonsmoking areas separate.

(5) Smoking is not permitted within 50 feet of gasoline, paint, oil, or other flammable liquid storage, nor in areas where combustible supplies and materials are stored. Smoking is not permitted in the vicinity where oxygen, acetylene, or other flammable gases are being stored or used.

(6) Cigarettes and other smoking materials will not be sold or distributed on the hospital compound.

(7) Ashtrays of noncombustible material and safe design shall be provided and clearly marked at all entrances, and available in smoking areas. All smoking areas must have a metal container with a self-closing lid available for emptying of ashtrays and the disposal of smoking materials.

6. **Directors, Department Heads, and All Supervisory Personnel.** *The senior person responsible for a particular area is responsible for the enforcement of the smoking policy. All staff members are encouraged to try to solve disputes arising from this policy in a courteous manner. Problems not solved in the immediate area must be referred in the appropriate chain of command.*

7. **Head, Food Service.** *Tasked with the establishment and enforcement of 5C(4).*

8. **Head, Staff Education and Training Department.** *Because of the example the hospital sets in encouraging good health and preventing disease, all staff members are encouraged to educate patients and the public in the dangers of smoking and the desirability of quitting. Smoking quitting clinics shall be held on a regular basis. Special emphasis should be placed on high-risk groups such as pregnant women, parents, adolescents, and patients already afflicted with cigarette-caused illness. New staff members are to be informed of the smoking policy during their orientation.*

9. **Head, Facilities Management.** *Signs required by this instruction are to be prepared, posted, and maintained as appropriate.* □

Dr. Boone's First Battles

VADM Joel T. Boone, MC, USN (Deceased)

Library of Congress

When he died 13 years ago at age 84, VADM Joel T. Boone's career in the Navy Medical Department was already legendary. Commissioned a lieutenant junior grade in 1914, he eventually progressed through the ranks to vice admiral. Dr. Boone saw it all and did it all during his 36 years active duty, retiring the most decorated member of the Medical Department.

As Battalion and Regimental Surgeon, 6th Marine Regiment, and later as Assistant Division Surgeon of the 2d Army Division, American Expeditionary Forces, Dr. Boone earned the Congressional Medal of Honor and numerous other awards.

After the war he served as White House physician to Presidents Harding, Coolidge, and Hoover. During World War II he was 3d Fleet Medical Officer on ADM William F. Halsey's staff, and was one of three officers selected to liberate Allied POW camps in Japan even before military occupation of that nation began. On 14 Sept 1945 he stood on USS Missouri*'s deck representing the Navy Medical Department for the surrender ceremonies.*

It all began with LTJG Boone's deployment to Haiti in 1915 with a Marine artillery battalion. The following excerpt from his unpublished memoirs, edited by his son-in-law, Milton F. Heller, Jr., chronicles that unusual campaign.

In August 1915, only 14 months after having been commissioned a lieutenant junior grade in the Navy Medical Corps, I was on my way to Haiti with a Marine Corps artillery battalion. The Marines were expected to put an end to the anarchy in that Caribbean country and prevent Germany from gaining a foothold there in defiance of the Monroe Doctrine.*(1)**

My first view of Haiti, from the deck of USS *Tennessee,* was startlingly magnificent. I was struck by the clarity of the sapphire blue sea and towering mountains that extended from a high layer of fleecy clouds down through deep blue, clear skies, and ending almost at the water's edge.

However, my enchantment with Haiti's beauty was short-lived. The sights in Port-au-Prince, where we landed, were indescribably horrible: filth, congestion, and poverty everywhere. Adults and children alike relieved themselves on the sidewalks, gutters, streets, and even amidst raw produce for sale in the marketplaces, which looked like junkyards. Swarms of flies and other insects infested the excrement and food.

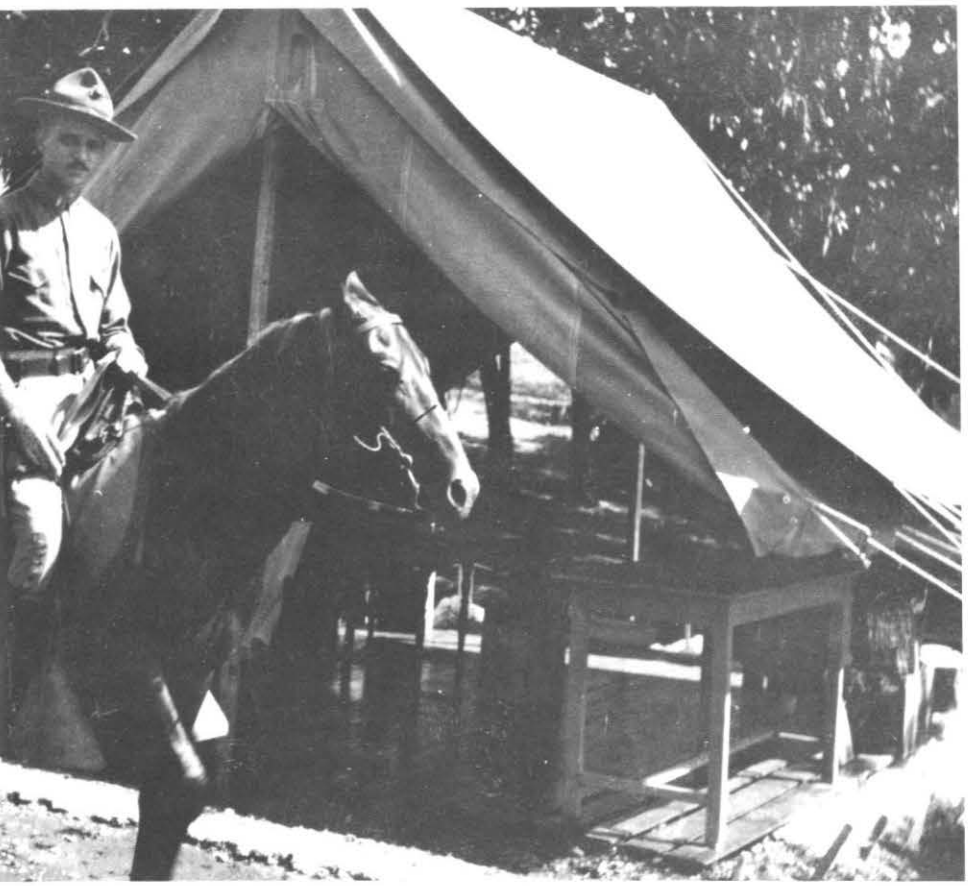
My first duties in Port-au-Prince and environs were to hold sick call for the marines and the native police and prisoners. I was also to try introducing rudimentary sanitation to the city. Medical and surgical facilities in the local hospitals were crude. When I was called upon to amputate the leg of a boy whose foot had been crushed under a train wheel, I had to operate on a wooden table, with a kerosene lamp for illumination and chloroform as an anesthetic.

After only a few weeks in Port-au-Prince, I was transferred to the 1st Regiment of Marines at Cap Haïtien, which lies across the northern peninsula from Port-au-Prince. The native Caco outlaws had been attacking the marines in this area.

Soon after arriving, I began my first field trip, a 5-day expedition with 50 enlisted marines and several officers. This was my introduction to sleeping on the ground with only a rock for a pillow and the heavens for protection. We arose in the morning wringing wet from the night's dew and found ourselves covered with ants and mosquitoes that seemed as large as horseflies.

Just a week later I rejoined the artillery battalion (13th Company) at Grande Rivière, a hamlet 15 miles inland from Cap Haïtien. From there I participated in a number of forays into the countryside. My company's instructions were to disarm the Cacos and destroy their fortifications, many of which could be approached only over frightfully twisting and precipitous trails. Cacos were like mosquitoes

*In July 1915, after a particularly bloody outbreak of social and political violence, the United States intervened to restore order. A provisional occupation regime, buttressed by the Marines and headed by a general serving as high commissioner, set to work pacifying the countryside and instituting political reforms patterned after the American model. The occupation lasted 19 years.



Dr. Boone poses in front of his dispensary tent during his Haitian tour.

hidden away in thick vegetation or trees. In bare feet they would approach us without making a sound. As they lurched out of hiding, they made skilled use of the machete in decapitating their victims.

Maintaining adequate sanitary conditions at Grande Rivière proved to be quite a challenge. Latrines were built and burned out daily with crude oil. We constructed an incinerator in which garbage and manure were burned with oil, producing a very hot fire. Buildings were scrubbed with chlorine of mercury and then whitewashed. We dispensed prophylactic quinine to the officers and men each evening as protection against malaria.

As the medical officer attached to CAPT Campbell's 13th Company of Marines, I was in on the battles for three of the Cacos' major strongholds, Fort Rivière, Fort Capois, and Fort Berthol.

The taking of Fort Rivière, high in the mountains, was a principal military objective, and it proved most difficult, requiring two separate attacks. Built by Napoleon's army before 1800, this fort, with its thick rock walls, had stood overgrown and unused for over a century until it was occupied by the Cacos.

The first major attack on Fort Rivière took place on 29 Oct 1915. The force consisted of 133 marines and a pack train of 20 mules and 12 horses. We marched and fought continuously for 21½ hours, from 4 a.m. to 1:30 a.m. the next day. The fort was perched atop a 4,000-foot ridge and could be approached only by a 2-foot wide trail that rose almost perpendicularly through a deep canyon. Under fire from the Cacos, who held five mountain peaks, the marines suffered many casualties. The heat, altitude, and severity of the climb also took its toll. I prodded the men along with a combination of encouragement and cursing. Finally, by pushing on and bringing machine guns into action, the marines succeeded in scaling the highest peak and driving the Cacos from the fortifications.

After going on to capture Fort Capois on 5 Nov and Fort Berthol on 8 Nov, with the help of a detachment of marines and a company of bluejackets from USS *Connecticut,* our attention turned once again to Fort Rivière. Unfortunately, the troops had failed to destroy the fort after the prior attack, and the Cacos occupied it once more.

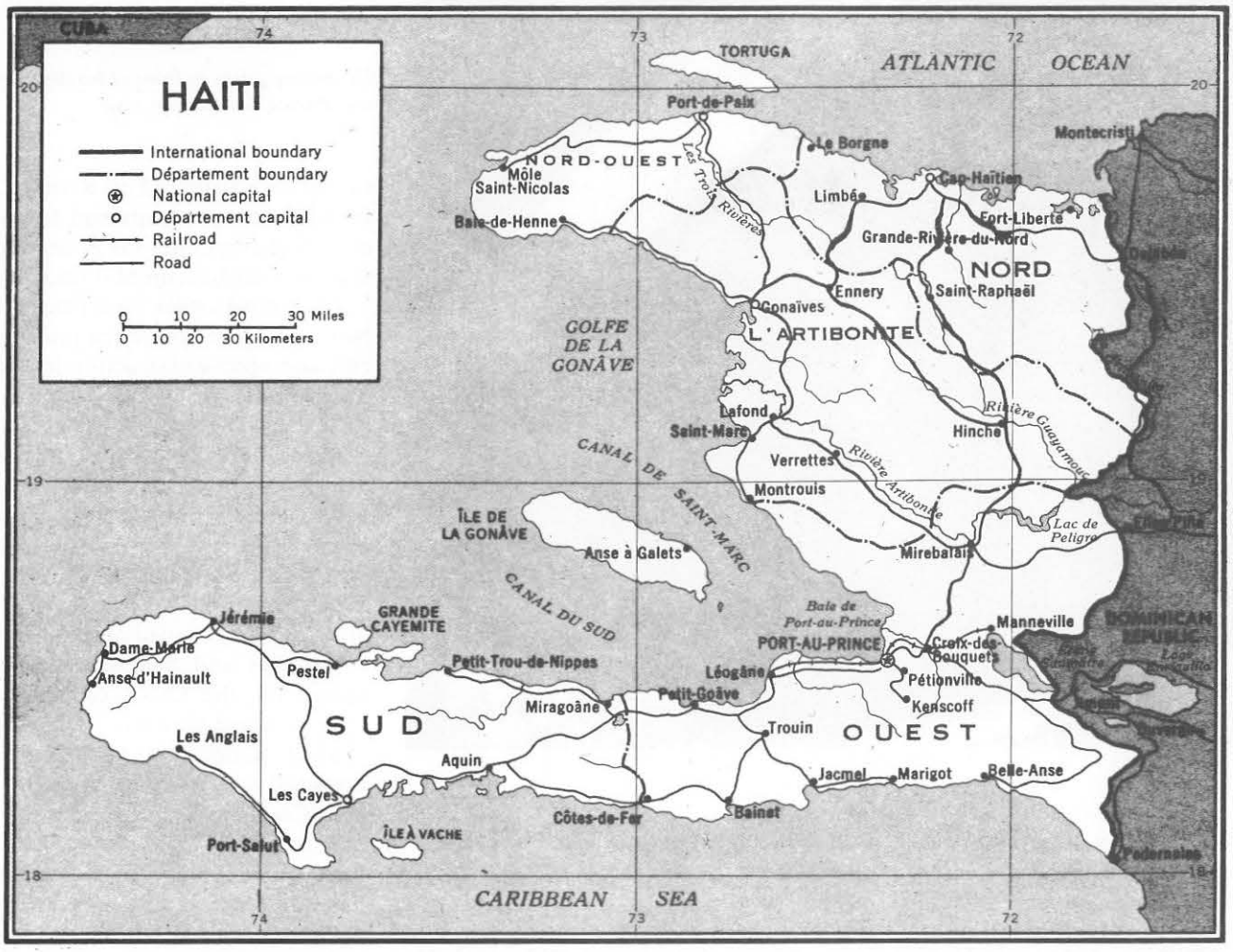
The second attack took place on 17 Nov and proved to be the most difficult and spectacular action in which the Marine Corps had participated since the Civil War. The attack was to be made from four directions, beginning simultaneously at 8 a.m.(*2*) MAJ Smedley Butler's 5th Company began firing from west of the mountain range 15 minutes before the appointed time. Soon thereafter, the other columns opened up and, with all approaches and apparent means of escape for the Cacos covered, our forces charged the fort.

MAJ Butler and his troops approached over an open plain, while the 13th Company had to go down from one mountain into a deep ravine and then up a 45-degree hill directly beneath the fort, thereby exposing ourselves to heavy fire.

As our machine guns swept the fort from the mountain we had descended, we spread out in a skirmish line and yelled as we climbed as fast as we could up the hill. When CAPT Campbell saw the Cacos coming through a broken place in the fort's wall and jumping into a dried-up moat, and that his lieutenants were already busy, he ordered me to take some men and go after them.

I took six marines, made a right flank movement with them, and headed toward the hole in the wall. The climb was so steep and the men so exhausted that they wanted to stop and rest. My cussing and yelling so surprised them that they kept moving with vigor. As we scrambled along, the Cacos continued to jump from the ramparts.

I was anxious that our little group should be the first to enter the fort. I pushed two men into the moat and up against the wall. From an embankment they shot several Cacos as they



fell over the wall. We were able to get one of our boys onto the wall by having him stand on a rifle held by three of us. Once up, he reached down, and with the help of a rifle, pulled each of us up atop the rampart. From there, we jumped into the fort itself as we shouted out, "13th Company," so our own troops would not mistake us for the enemy.

The men with me started a hand-to-hand encounter with the Cacos, shooting, bayoneting, and smashing their skulls with rifle butts. Suddenly, we heard someone scream, "Who the hell are you?" It was MAJ Butler and his men of the 5th Company; we quickly identified ourselves. Our linkup with Butler raised a question as to who had entered the fort first, Butler and his 5th Company, or I and my contingent from the 13th Company? Butler and I did not agree on this point.(*3*)

Soon after, the marines and bluejackets entered the fort from all directions, and the battle was over in less than 20 minutes. Not one of our men suffered even the slightest wound, while we killed 50 Cacos. As ordered, I carried a .45 revolver in my hand for self-protection, but I am pleased to report I did not use it.

We were jubilant over a victory that marked the virtual end of Cacos resistance in this part of the country. For my part in the action at Fort Rivière, I received from Secretary of the Navy Josephus Daniels the first award of my naval career—a Special Letter of Commendation—for being "cool under fire."

Only a few weeks after the battle for Fort Rivière, I was ordered to duty in Port-au-Prince and from there on to Jèrèmie, due west of Port-au-Prince near the tip of the southern peninsula.

The people of Haiti intrigued me. The mountain folks, who made no pretense of being married, practiced voodooism, and they would become hysterical, even maniacal, in their orgies. They even sacrificed and ate babies.

I found graft to be rampant in Jèrèmie. In making my daily inspection of the prison, I learned that the jailer was extracting 50 cents from each prisoner due to be released. If the prisoner refused to pay up, he would be kept locked up indefinitely. Judges, district attorneys, and political leaders were known to have been living on graft for years.

One of the advantages of being transferred to Jèrèmie was that my wife, Helen, could join me there. She was the first American white woman to come there to live and created quite a sensation among the natives.

During the 4 months we were in Jèrèmie I was required, from time to time, to accompany the paymaster on trips into the countryside, by boat or horseback. These trips were not altogether pleasant as revealed by some

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The Marines celebrate their capture of Fort Rivière.

NAVMEDCOM Archives

Dr. Boone in later years

random comments extracted from my diary: "The French serve too much wine for comfortable traveling . . . . Paid the people and turned in after a rotten supper . . . . Had lunch with Mayor—garlic and grease . . . . Roads very rough and mountainous . . . . Disgusted with that way of traveling . . . . Mosquitoes very bad, interfering with my sleep."

It was about 14 June 1916, a few days after the most recent trip with the paymaster, that I came down with estivo-autumnal malaria, a very malignant form of the disease. I became desperately ill very quickly with a high fever, horrible headaches, body aches, and nausea.

When the native doctor's prescription that I drink a lot of rum failed to work, I was taken by a special tug to the field hospital in Port-au-Prince, where I arrived about 20 June. I have no recollection whatsoever of this journey.

In Port-au-Prince I was given a very large dose—I think they said 500 cc—of quinine solution, which resulted in a severe circulatory collapse. I remember lying semiconscious in the hospital as the cot seemed to slip out from under me and I floated off into space. I sensed that I was losing consciousness and probably dying when I heard the doctor, as he felt my pulse, say to the hospital corpsman, "My God! Get me camphorated oil immediately!"

Next I heard the corpsman say that they had no camphorated oil and the doctor respond excitedly: "For God's sake, get me some ether, bring me several hypodermics of ether! I want . . . Boone's dying! I can't get his pulse at all now; I could a little bit ago." I remember opening my eyes with great effort and saying, "Please do all you can for me," before losing consciousness again.

He gave me several hypodermic injections of ether which served to restore my circulation.

From Port-au-Prince I went to the hospital ship USS *Solace,* while Helen, my bride of barely 2 years, was left to her own devices to make her way back to the United States. After extended treatment on board the *Solace,* I gradually regained an appetite and the ability to sleep through the night.

When the time came for Dr. Kennedy, the medical officer in command of the *Solace,* to report on my condition to the Bureau of Medicine and Surgery, he wrote, "Return to duty in Haiti very doubtful." Dr. Kennedy felt very strongly that I should have a complete rest and change of climate. I had been looking forward eagerly to an appointment as one of two medical officers to be assigned to the constabulary or peacekeeping force in Haiti, especially since Helen and I had had an opportunity to sample a very pleasant life together in Jèrèmie.

Upon arriving home, I found that because of my malignant malarial illness the Bureau of Medicine and Surgery would not approve of my return to Haiti. To my regret, this proved to have been both the first and last time I was to visit that country.

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2. *Field Order #1* issued by Eli K. Cole, COL, USMC, Commanding, at Headquarters, 1st Regiment, 1st Brigade, US Marine Corps, Grande Rivière, Haiti, 14 Nov 1915.

3. Letter dated 23 Sept, 1936 from Boone to LCOL T.E. Thrasher, USMC. □

Research and Navy Nurses
Challenging the Profession

LT S.B. Stewart, NC, USNR-R

How much research is being conducted by Navy nurses? What topics are being studied? Who is implementing the studies?

In all areas of nursing, research can provide answers to numerous clinical questions and the impetus for change in current nursing practice. Navy nurses can and should influence their practice with facts based on scientific inquiry.

- What is the relationship between preoperative teaching and length of hospital stay?
- What is the most effective temperature-taking route, i.e., oral, axillary, rectal, in post anesthesia care unit (PACU)?
- What rewarming methods are most effective for PACU patients?
- What is the best method for arousing a child following general anesthesia?

These, along with many other clinical questions are asked by nurses in the daily care of their patients. Yet, many go unanswered because we fail to conduct research studies essential for yielding scientific data to support or change our current practice.

Because of the clinical risks often associated with postoperative hypothermia, a research project was implemented to study the incidence of hypothermia in PACU adults.(*1*) The study proved significant for nursing practice and also raised further questions regarding care of the hypothermic patient during the entire perioperative period. Additionally, because this was the first study of its kind conducted by Navy nurses in the PACU setting, it emphasized the need for clinical research in other areas of Navy nursing.

With so few Navy nurses conducting clinical research, the arena of researchable topics is wide open. Many possibilities exist, but a lack of knowledge about the research process and the significance of clinical research activities may be an influencing factor. Unless nursing education included a research course or research procedure, it is unlikely that one would venture into this arena.

Nursing programs that lack formal education in the research process certainly would explain why many Navy nurses are not involved in research studies. However, what factors influence the nurses who *were* prepared at the baccalaureate level or higher and are not involved in research activities?

This question leads to the second influencing factor—the inability to bridge research and practice. Education and socialization are imperative if nurses can be expected to identify and implement scientifically-based studies. Navy nurses are readily able to identify areas of concern in patient care, staffing, and administrative areas, but seem unable to translate these concerns into researchable questions. For example, rewarming patients in the PACU is a standard procedure. However, what rewarming methods are most effective? This question can be translated into a valuable research project to determine a specific protocol for rewarming postoperative patients.

Time is also an important factor. How many nurses know how to incorporate a research project into their daily work activities? An experienced nurse researcher could assist staff nurses in facilitating a research project even in the busiest of clinical settings.

A final significant factor may be the lack of practicing nurse researchers or role models in the Navy. Effective role models are necessary in all areas of nursing. No matter what educational level they possess, nurses who involve themselves in research provide significant motivation to their peers.

Unfamiliarity with resources essential to carry out research may also hinder the nurse's ability to implement a study. For example, does your hospital have a research and development department that could assist you in the early preparation of your proposal? Is there a clinical specialist or experienced nurse researcher who could act as your mentor in assisting with your project? What is the protocol for submitting a research proposal? What is your department's philosophy regarding nursing research activities? Do you have readily available library resources? Where do you get your data analyzed? Nurses interested in research should know the answers to these commonly asked questions.

The following suggestions will assist in promoting participation by Navy nurses in research activities.

LT Stewart is assigned to Branch Clinic 120, Treasure Island, CA.

1. Determine the level of education of the nurses in your area. What is their research knowledge base? What are their research interests?

2. Provide inservice education classes to broaden the nurse's knowledge of clinical research. Invite an *active* nurse researcher to discuss the application and significance of scientific inquiry in your area of practice.

3. Start a journal club. Meet to review and discuss research related to your area of practice. Make sure your nursing department or library subscribes to a variety of nursing journals.

4. Attend research conferences. This is the best way to learn about what other nurses are studying.

5. Get involved in your hospital's research committee. If you do not already have one, start one.

6. Get a nurse expert to show you how to incorporate a research project into your daily schedule. Remember, research projects need not be lengthy and burdensome. It can be a group effort.

7. Find out what your nursing department thinks about nursing research. Keep your charge nurse and area coordinator aware of your involvement.

8. Know where you can find nursing literature, computer services, or expert assistance. You may need to call other hospitals in your area for this information. Collaboration and communication with other nurses is essential for building a support system for your research efforts.

9. Know your hospital's protocol for submitting a research proposal.

10. Communicate the research activities conducted in your hospital with other Navy nurses. As a result of the project discussed in this article, several PACU charge nurses have asked for further information on the study results. Query journals that would be interested in topics you wish to research and publish. Your fellow Navy nurses are eager to learn about your efforts.

With a clear understanding of the significance for carrying out research, as well as knowing how to overcome obstacles, Navy nurses will be better prepared and eager to enter the research arena.

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NAVMEDCOM Names Sailor of the Year

It's only April and already 1987 is a year HM1 Robert B. Taylor will always remember. Not only is his wife, Nancy, due to have their second child in July, but Taylor, 31, has been chosen the Naval Medical Command's FY 1987 Sailor of the Year. And to top it off, the young enlisted man has just learned that his dream of being commissioned an officer in the Medical Service Corps is finally about to come true.

An instructor of microbiology and urinalysis at the medical laboratory school at the Naval School of Health Sciences (NSHS) in Bethesda, MD, Taylor shared credit for his selection as Sailor of the Year with others on his Navy team.

Taylor earned his master's degree in systems management from the University of Southern California in 1986 and intends to pursue a career in hospital administration as a MSC officer.

A native of Endicott, NY, he enlisted in the Navy after graduating from the State University of New York College at Oswego in 1978. He was a ward corpsman at Naval Hospital, Bethesda, attended advanced lab school in San Diego, CA, and supervised the chemistry department in the laboratory at Naval Hospital, Beaufort, SC. Taylor served as a lab technician on the USS *Proteus* (AS-19), homeported in Guam, before coming to Bethesda. In 1986 he received the Navy Achievement Medal.

HM1 Taylor and wife, Nancy

Taylor now competes for the honor of being named Shore Sailor of the Year. The other finalists for MEDCOM Sailor of the Year were HM1 David C. Jones and HM1 Karen A. Garcia.

Ophthalmic Microsurgery at Sea

LCDR Douglas R. Shearer, MC, USN CAPT Ben T. Ho, MC, USN

The potential for being blinded during a war is a devastating fear facing any soldier, sailor, airman, or marine. Recent statistics categorizing types of combat casualties in modern warfare reveal an alarming increase in the percentage of ocular injuries with each successive conflict.(*1,2*) Present estimates indicate that ocular wounds would comprise at least 10 percent of wartime injuries in a conventional weapons scenario. However, newer medical technology and microsurgical techniques such as pars plana vitrectomy offer the military ophthalmologist management capabilities previously unknown in providing an improved prognosis for severely traumatized eyes.

Currently, for U.S. Forces this level of surgical capability is available only at tertiary care CONUS facilities. With the reintroduction of hospital ships to the fleet, the inclusion of onboard microsurgical capability would result in a greater opportunity to provide timely definitive care. This paper details a study examining the feasibility of such a deployment.

The ship utilized in the trial was USS *Hector* (AR-7) which is a heavy hull repair ship. The *Hector* has similar dimensions to the USS *Sanctuary,* a hospital ship functioning during the Korean and Vietnam conflicts upon which hundreds of intraocular procedures were performed (see table).

Weck and Zeis portable operating microscopes were secured to the deck of a forward compartment beneath the fo'c'sle. This location maximized those ship movements which affected the operating stage while the ship was steaming at sea. The operative stage was set upon an examination table and a standard cataract pack was utilized.

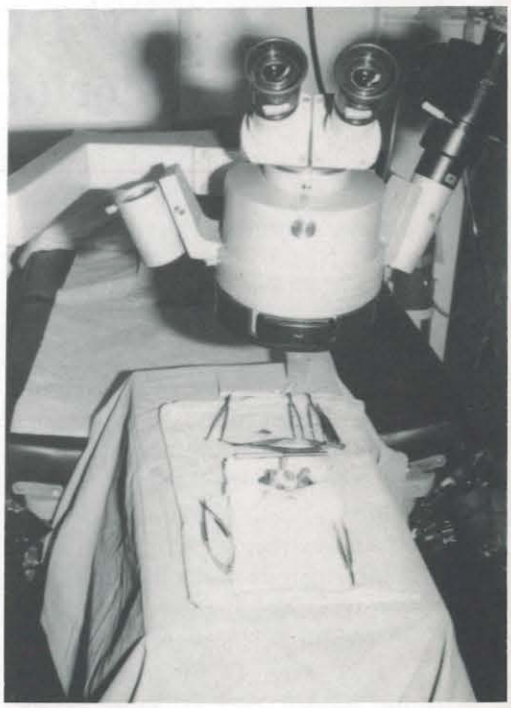
Ship	Gross Tons	Length	Beam	Draft
Sanctuary	15,400	529′	71′5″	24′
Hector	16,200	529′	73′3″	23′3″
Mercy	69,400	894′	105′9″	32′9″

A total of 12 procedures were performed on donor pig eyes as outlined:

Repair corneal laceration—4
Repair of scleral laceration—4
Intraocular procedure
(e.g., lentectomy)—4

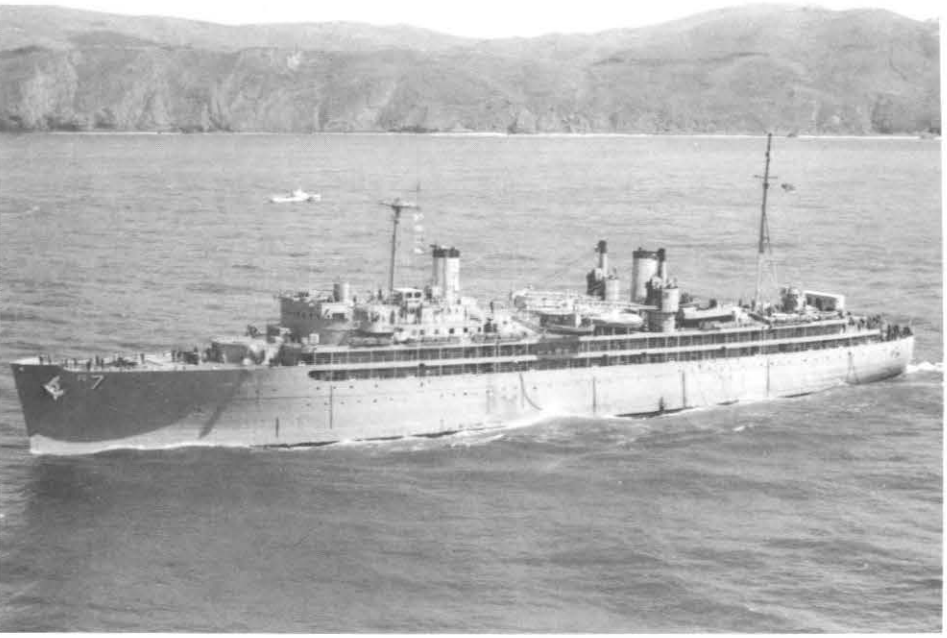
Underway in 6-foot seas, the ship's pitch and roll did not affect surgical quality. Each procedure was accomplished without compromising surgical adeptness. It was the surgeons' impression that more exacting procedures could have been performed without difficulty. Transient nausea was experienced secondary to motion of the surgeon without concomitant motion of the microscopic field but did not pose a significant problem and could be easily rectified with appropriate medication. Placement of the microsurgical suite in a more central compartment on the presently proposed and relatively larger hospital ships would undoubtedly further enhance both platform stability and surgical facility and allow procedures to be performed in even more adverse sea conditions.

The incidence of combat ocular injuries has climbed steadily through the past century. Best statistics indicate that the percentage of eye injuries during the Vietnam conflict was at least three times that suffered during World War II.(*3*) In Vietnam 152 major ocular injuries were suffered monthly with approximately 20 cases requiring more intricate surgery such as vitrectomy. The Israeli experience in the Yom Kippur War revealed that 25 percent of the cases involving eye



Ophthalmologist's view of the microsurgical operating field.

Dr. Shearer is on the staff of the Department of Ophthalmology, Naval Hospital, Oakland, CA 94627-5000. Dr. Ho is chairman of the department.



USS Hector

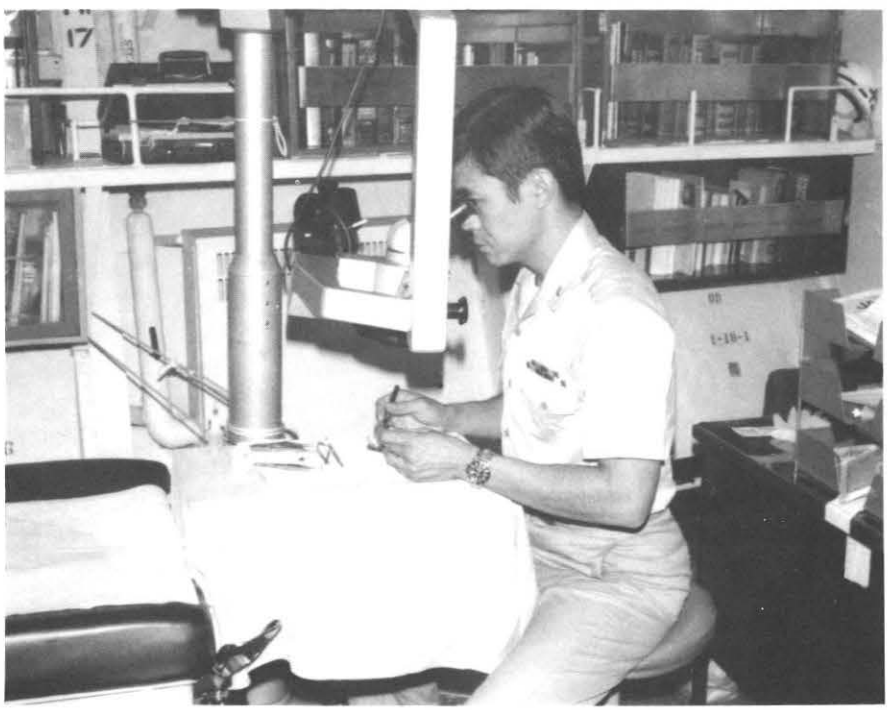
trauma would have benefited from vitrectomy. This case load may be greatly exceeded in the next conflict where even with conventional weapons 10 percent of all wounded personnel will suffer potentially blinding injuries.

The higher incidence of serious eye injuries is produced by the new small high velocity penetrating metallic fragments which are characteristic of modern warfare, particularly that involving armored conflict. These fragments impacting on the unprotected eye result in extensive permanent damage to any and all vision.

Recent advances in ophthalmic surgical methods including microsurgical techniques have aided treatment and resulted in an improved prognosis for ocular injuries. Surgical management is directed toward repair of the initial wound with attempted correction of associated damage and reduction in secondary complications namely infection, hypotony, vitreous traction, retinal detachment, glaucoma, and chronic uveitis. Primary repair should be accomplished as soon as feasible. The timing of early vitreous surgery is variable, but it is generally regarded that 10-14 days postinjury represents the optimal timeframe in which surgical intervention can best retard the development of those complications which lead to permanent blindness.(*4*)

Cases involving endophthalmitis, reactive foreign bodies, and retinal detachment would require earlier surgery. During the Vietnam conflict, transfer of patients from injury site to CONUS facilities properly manned and equipped to manage serious ocular trauma was 18.5 days without ophthalmic care available during medevac flights. While no doubt exists that an improved response could be expected from the present air-evacuation system, contingency planning must consider a medical response in the conflict where control of air space and optimal weather and geography are not assured. This would produce a recurrence of delays which would result in avoidable visual morbidity.

Currently, microsurgical equipment is not designed into planned hospital ships, the addition of which would help assure the proper timing of surgical repair. Our study illustrates that the inclusion of microsurgical capability is a feasible addition to the presently proposed hospital ships aiding in the management of ocular injuries sustained during combat.



Dr. Ho demonstrates a microsurgical procedure on pig eyes.

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